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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/416,270	10/12/1999	YOUN-HAN CHANG	400396/YPLEE	5941

23548 7590 09/26/2003

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EXAMINER

DOVE, TRACY MAE

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/416,270

Applicant(s)

CHANG ET AL.

Examiner

Tracy Dove

Art Unit

1745

-- **Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23,28-32 and 34-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23,28,29,35 and 36 is/are allowed.
- 6) ☒ Claim(s) 30-32,34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the communication filed on 9/4/03. Applicant's arguments have been considered, but are not persuasive. Claims 23, 28-32 and 34-36 are pending. Claims 30-32 and 34 are rejected. Claims 23, 28, 29, 35 and 36 are allowed. This Action is made **FINAL**, as necessitated by amendment.

Claim Objections

Claim 34 is objected to because of the following informalities: claim 34 depends from canceled claim 27. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 30-32 and 34 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, and alternatively unpatentable over, Fauteux et al., US 4,925,752.

Fauteux teaches a solid state alkali metal anode cell having significant improvements in cell impedance and, in turn, rechargeability is provided (col. 2, lines 31-36). The cell comprises

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an alkali metal anode layer, a solid ionically conducting electrolyte layer and a cathode/current collector layer (see abstract). The cathode current collector has a plurality of surface voids (openings) which contain the cathode composition (active material). See col. 3, lines 44-50. The alkali metal anode layer may be a lithium coated foil such as copper foil. The copper foil (current collector) has a layer of lithium (active material) deposited on its surface. See col. 3, lines 64-66. The solid electrolyte layer includes an ionizable salt and a polymer, and is located between the anode and the cathode. The cathode collector may be made of aluminum. See col. 5, lines 5-62. See also claim 12.

Specifically, Fauteux teaches a solid state electrochemical cell having a porous cathode current collector. The cathode/current collector layer comprises a substrate which has a plurality of surface voids. As shown in Fig. 1, the substrate is in the form of a screen or grid. However, other physical forms such as foamed states, etched foils, electroplated films, woven or non-woven fabrics may be utilized as the substrate. A collector of expanded metal is disclosed in col. 2, lines 54-63. The cathode composition (active material) is coated onto at least one surface of the positive current collector. See col. 3, lines 44-53. The alkali metal anode layer may take the form of a lithium foil, a lithium coated foil such as nickel or copper foil having a layer of lithium deposited on its surface or a lithium alloy. See col. 3, lines 63-66. The electrolyte layer, which is ionically but not electrically conductive, takes the form of a solid material (separator) and is laminated to the alkali metal anode layer and the cathode/current collector layer. See col. 4, lines 3-6. Cathode compositions are disclosed at col. 5, lines 21-44. To produce the cathode/current collector material, the materials used to form the cathode composition are mixed together (slurry) and coated onto the surface of the current collector substrate (col. 5, lines 63-66). The

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completed cells may be manufactured utilizing any of a number of different methods. For example, once each of the anode layer, electrolyte layer and cathode/current collector layer are manufactured, they may be laminated together to form a solid state cell (col. 6, lines 20-25).

Thus the claims are anticipated.

The claims are alternatively unpatentable because the courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious. In re Fessman. Thus, whether the anode is formed of a lithium foil (no plasticizer needed), a lithium coated foil such as copper foil or a carbon containing slurry coated on a metal foil, a lithium polymer battery is the end result.

Allowable Subject Matter

Claims 23, 28, 29, 35 and 36 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: the claims are directed toward a method of making a lithium polymer battery comprising preparing a positive active material slurry including a plasticizer to produce a first mixture, stirring the mixture, and then applying the first mixture to opposite sides of an aluminum foil with a plurality of through holes. The method further includes preparing a negative active material slurry including a plasticizer to produce a second mixture, stirring the mixture, and then applying the second mixture to opposite sides of a copper foil free of holes. The positive and negative electrodes are laminated on opposite sides of a separator and then the plasticizer from both electrodes is extracted.

Narang et al., US 6,168,885 teaches the fabrication of electrodes for a lithium polymer battery. Narang teaches a lithium secondary battery having an anode, a cathode and an

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electrolyte. The anode is formed by mixing an anode slurry including a material capable of intercalating metal ions, a binder, a solvent and optionally a monomer and a catalyst. The intercalation material may be a carbon material such as graphite, coke or mesocarbon microbeads. The binder is preferably polyvinylidene fluoride (PVDF). See col. 6, lines 37-53. The anode current collector may be a foil (without holes) or a grid (with holes). See col. 9, lines 43-50. The cathode is formed by a process similar to that for producing an anode (see col. 10, lines 54-col. 11, lines 3). Narang teaches that the disclosed method of forming electrodes obviates the need for the time consuming extraction process (plasticizer) and, therefore, the need to use porous current collectors (col. 4, lines 22-35). Thus, while Narang teaches and suggests a porous current collector is not needed, Narang does not teach the method of the instant claims because Narang eliminates the need for an extraction process (use of a plasticizer).

Response to Arguments

Applicant's arguments filed 9/4/03 have been fully considered but they are not persuasive.

Applicant argues that the rejection of claims 30-32 and 34 (product claims) in view of Fauteux is erroneous because there is no description in Fauteux of forming a battery comprising the three plate structure in claims 23 and 35. However, claims 23 and 35 are method claims. Method limitations in product-by-process claims, in the absence of unexpected results, are obvious. Fauteux teaches the completed cells may be manufactured utilizing any of a number of different methods. For example, once each of the anode layer, electrolyte layer and cathode/current collector layer are manufactured, they may be laminated together to form a solid state cell (col. 6, lines 20-25).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan, who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

September 23, 2003


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700